Table 1 Recd 03MAY00

Co-graft Example	Composition EPR%	PE type	PE%	MI (190C) dg/min.	MA %	Dryflow sec	Massing 50C, 24 hr.
1	78	PE 1	22	4.6	0.92	36	none
2	76	PE 1	24	3	1.2	22	none
3	47.5	PE 1	52.5	0.95	1	5.7	none
4	47.5	PE 1	52.5	1.7	0.89	5.8	none
5	19	PE 1	81	0.9	0.82	5.5	none
6	19	PE 1	81	0.49	1.27	5.8	none
7*	0	PE 1	100	0.43	1.41	5.4	none
8*	0	PE 1	100	0.43	0.92	5.3	none
9	76	PE 2	24	4.1	0.96	18	none
10	76	PE 2	24	3.2	1.38	16	none
11	47.5	PE 2	52.5	2	1.2	7.6	none
12	47.5	PE 2	52.5	2.8	0.84	8.3	none
13	19	PE 2	81	1.5	0.91	6.2	none
14	19	PE 2	81	1.1	1.33	6.3	none
15	0	PE 2	100	1	1.4	6.4	none
16	0	PE 2	100	1.21	0.91	6.4	none
17*	100		0	6.9	0.67	48	massed
18	76	PE 3	25	4.7	1.03	89	breakable
19	76	PE 3	24	3.2	1.26	61	breakable
20	47.5	PE 3	52.5	2.5	1.05	40	none
21	19	PE 3	81	3.8	0.89	31	none
23	19	PE 3	81	2.3	1.17	28	none
24*	0		100	2.4	1.24	30	none
25*	0		100	3.6	0.91	34	none
26	85.5	PE 3	14.5	5.6	1.08	82	massed,breakable
27	90	PE 3	10	9.1	0.84	1.09	massed
28*	95		5	5.8	1.13	47	massed,breakable

* = comparative

The massing tendencies were evaluated by subjecting the polymer under a pressure of 100 g/sq. cm at 50°C for a period of 24 hr. The pressure is similar to the one experienced by the bottom layer of a 1 ton pallet of resins. At the end of the period, the polymer was inspected to see if the pellets have massed together and if so, whether the mass can be broken up.

In the dry flow experiment, 250g of the resin was allowed to pass through a stemmed plastic funnel (diameter of the stem is about 2 cm). The time it took for the resin to pass through was recorded. This time is dependent on the shape of the pellets, but since all the samples are produced under similar conditions, their shapes are similar. The relative dry flow time is therefore a good indication of how easy the resin can be handled.

WHAT IS CLAIMED IS:

1. A polymeric co-graft, comprising,

(a) a copolymer of ethylene with one or more α-olefins having at least 4 carbon atoms and having a density of 0.930 to 0.880 g/cc and an melt index (MI) of 0.01 to 50 dg/min at 190°C, 2.16 Kg;

(b) a massing polymer selected from a copolymer of ethylene with one or more α-olefins having at least 3 carbon atoms and having a density of 0.850 to 0.880 g/cc and an MI of .01 to 50 dg/min at 190°C, 2.16 Kg wherein the ratio of (a) to (b) is 10:90-90:10; and

(c) .05-5 wt % relative to (a) and (b) of a grafted monomer covalently bonded to (a) and (b) selected from an olefinic carboxylic acid or anhydride or derivative thereof.

2. The polymeric co-graft of claim 1 wherein component (a) has a density of 0.890 to 0.920 g/cc and an MI of 0.1 to 10 dg/min and component (b) has a density of 0.855 to 0.875 g/cc and an MI of 0.1 to 10 dg/min.

3. The polymeric co-graft of claim 1 wherein component (a) has a density of 0.90 to 9.10 g/cc and an MI of 0.5 to 5 dg/min and component (b) has a density of 0.86 to 0.87 g/cc and an MI of 0.2 to 2 dg/min.

4. The polymeric co-graft of claim 1 wherein component (a) has a density of 0.890 to 0.920 g/cc and an MI of 0.1 to 10 dg/min and component (b) has a density of 0.855 to 0.875 g/cc and an MI of 0.1 to 10 dg/min wherein component (c) is 0.1 to 3 wt % relative to (a) and (b).

5. The polymeric co-graft according to claim 1 wherein component (a) has a density of 0.90 to 9.10 g/cc and an MI of 0.5 to 5 dg/min and component (b) has a density of 0.86 to 0.87 g/cc and an MI of 0.2 to 2 dg/min wherein component (c) is 0.3 to 2 wt % relative to (a) and (b).

6. The polymeric co-graft according to claim 1 wherein component (a) is selected from a linear low density polyethylene and component (b) is selected from an ethylene/propylene/diene monomer, ethylene/propylene rubber; a metallocene polyethylene having a melt flow ratio I_{10}/I_2 of less than 6.53 and an M_w/M_n ratio of greater than the melt flow less 4.63; a metallocene polyethylene having a melt flow ratio I_{10}/I_2 of greater than 6.13 and an M_w/M_n ratio of equal or less than the melt flow ratio less 4.63; and (c) is selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic acid, nadic acid, citaconic acid, itaconic acid and anhydrides, metal salts, esters, amides or imides of said acids.

7. The polymeric co-graft according to claim 6 wherein said co-graft is non-massing.

8. A composition, comprising

(1) a polymeric co-graft, comprising

(a) a copolymer of ethylene with one or more α-olefins having at least 4 carbon atoms and having a density of 0.930 to 0.880 g/cc and an MI of 0.01 to 50 dg/min at 190°C, 2.16 Kg;

(b) a massing polymer selected from a copolymer of ethylene with one or more α-olefins having at least 3 carbon atoms and having a density of 0.85 to 0.88 g/cc and an MI of .01 to 50 dg/min at 190°C, 2.16 Kg wherein the ratio of (a) to (b) is 10:90-90:10; and

(c) .05-5 wt % relative to (a) and (b) of a graft monomer covalently bonded to (a) and (b), selected from an olefinic carboxylic acid or anhydride or derivative thereof; and

(2) an olefinic or non-olefinic material.

9. The composition according to claim 6 wherein the non-olefinic material is selected from a polyamide and wherein the weight percentage ratio of (1):(2) is 3-40:97-60.

10. The composition according to claim 7 wherein the polyamide is selected from nylon 6 or nylon 6,6 and wherein the weight percentage ratio of (1):(2) is 15-25:85-75.

11. A fabricated material, comprising

(1) a polymeric co-graft, comprising

(a) a copolymer of ethylene with one or more α-olefins having at least 4 carbon atoms and having a density of 0.930 to 0.880 g/cc and an MI of 0.01 to 50 dg/min at 190°C, 2.16 Kg;

(b) a massing polymer selected from a copolymer of ethylene with one or more α-olefins having at least 3 carbon atoms and having a density of 0.85 to 0.88 g/cc and an MI of 0.01 to 50 dg/min at 190°C, 2.16 Kg, wherein the ratio of (a) to (b) is 10:90-90:10; and

(c) .05-5 wt % relative to (a) and (b) of a graft monomer covalently bonded to (a) and (b);

(2) an olefinic or non-olefinic material.

12. A method of eliminating the massing propensity of a grafted or un-grafted massing polymer selected from a copolymer of ethylene with one or more α-olefins having at least 3 carbon atoms wherein the ungrafted copolymer

has a density of 0.85 to 0.88 g/cc and an MI of 0.01 to 50 dg/min at 190°C, 2.16 Kg, comprising, co-grafting said massing polymer with a copolymer of ethylene with one or more α-olefins having at least 4 carbon atoms and having a density of 0.930 to 0.880 g/cc and an MI of 0.01 to 50 dg/min at 190°C, 2.16 Kg with a grafting monomer selected from an olefinic carboxylic acid or anhydride or derivative thereof.

13. A process for producing a polymeric composition, comprising,

(a) preparing an olefinic carboxylic acid or anhydride modified copolymer of ethylene and one or more α-olefins having at least 4 carbon atoms/massing polymer blend to form a non-massing co-graft; and

(b) combining the non-massing co-graft produced in step (a) with

(1) a polyamide to form, under suitable reaction conditions, the polymeric composition, or

(2) another non-olefinic material or olefinic material to form the polymeric composition.

14. The process according to claim 13 wherein a partitioning agent is not required to eliminate or diminish massing of a massing polymer.

15. The process according to claim 13 wherein step (a) comprises,

(1) feeding both the massing polymer and the ethylene-α-olefin at a ratio of 10-90 wt % ethylene-α-olefin to massing polymer into the feed throat of a twin screw extruder at a barrel temperature of 150-400°C;

(2) optionally introducing free radical initiator and introducing an olefinic carboxylic acid or anhydride or derivative thereof into the extruder to form the polymeric co-graft;

(3) removing excess unreacted olefinic carboxylic acid or anhydride and isolating the polymeric co-graft; and step (b) comprises, melt-blending the polymeric co-graft produced in step (a) with polyamide in an extruder, internal mixer or rubber mill at a temperature sufficient to melt the blend to form the polymeric composition.

16. The process according to claim 15 wherein the polymeric co-graft is selected from the composition according to claim 1 and the olefinic carboxylic acid or anhydride is maleic anhydride and the polyamide is selected from nylon 6,6 or nylon 6.